

Smart Walker

Client: Mr. Daniel Kutschera

Advisor: Prof. Justin Williams

Team Members: Nicolas Maldonado, Shreya Venkatesh, Navya Jain, Xicheng Yang

Name	Email	Role
Nicolas Maldonado	namaldonado@wisc.edu	Leader
Shreya Venkatesh	svenkatesh9@wisc.edu	Communicator
Navya Jain	njain52@wisc.edu	BPAG & BWIG
Xicheng Yang	xyang622@wisc.edu	BSAC

Problem statement:

The client, a physical therapist working in neuro-rehabilitation, has several patients who use walkers as transition devices. He needs a smart walker for his patients that can objectively measure gait speed, distance walked, and the weight/force applied through the walker. Data is required by Medicare to demonstrate progress and efficacy, but can also help improve clinical assessment and motivate patients as they work to reduce device dependence. Currently, quantitative measurements are taken manually, which is time-consuming and incomplete, as there is no way to measure weight-bearing. Two prototypes have been made by modifying an existing walker, but this compromises structural integrity and is not viable for patient testing. The main goal is to develop a safe, attachable assessment device that provides real-time, clinically relevant gait and weight-bearing data for use with standard walkers by clinicians and patients.

Brief status update:

As a team, we spent time understanding the problem statement, purpose, and topic. We each did at least four articles' background research and outlined questions to ask the client on February 2. We are also preparing the required information for the product design specification.

Difficulties/advice requests:

Nothing at the moment.

Major team goals for the next week

1. Continue doing research and reviewing old group work
2. Begin working on the Product Design Specification Document
3. Start discussing new design ideas
4. Discuss the updates from the client meeting

Next week's individual goals

Navya:

- Continue working on background research
- Continue reviewing previous semester's work
- Update product specification based on the conversation with the client

Shreya:

- Outline questions to ask the client based on updated product design specifications
- Research higher-quality sensors and the old group's technical work

Nicolas:

- Look into new hardware for detecting distance from the wall
- Research the compatibility of all components

Xicheng:

- Research the indoor distance measurement options to upgrade the current LiDAR system
- Get self-familiar with past project files and outcomes

Timeline

Task	January		February				March				April				
	23	29	5	12	19	26	5	12	19	26	2	9	16	23	29
Project R&D	/	/													
Empathize															
Background...															
Prototyping															
Testings															
Deliverables															
Progress Reports		X													
Prelim presentation															
Final Poster															
Meetings															
Client															

Advisor															
Website															
Update	X	X													

Filled boxes = projected timeline

X = task was worked on or completed

Previous week's goals and accomplishments

Get to know teammates, outline roles and responsibilities, create a communication plan.

Activities

Name	Date	Activity	Time (h)	Week Total (h)	Sem. Total (h)
Nicolar Maldonado	26/01/26 28/01/26	Team meeting Background research	0.5 1	1.5	1.5
Shreya Venkatesh	26/01/26 28/01/26 29/01/26	Team meeting Found 2 primary sources for research Reviewed old groups poster/report	0.5 0.5 1	2	2
Navya Jain	26/01/26 27/01/26 28/01/26 29/01/26	Team meeting Research Reviewed previous semester work Research	0.5 0.5 0.5 0.5	2	2
Xicheng Yang	26/01/26 28/01/26 29/01/26	Team meeting Review previous group works Research	0.5 0.5 1.5	2.5	2.5

Current design

No current design to report.

Materials and expenses

No current design to report.